

## CLAIMS

- 1 1. A method for preparing a mesoporous composition, comprising the steps of:
  - 2 (A) dissolving a first compound possessing amphipathic properties together with an
  - 3 alumina source in a first solvent to form a mixture;
  - 4 (B) stirring the mixture of step (A);
  - 5 (C) adding a second solvent to the stirred mixture of step (B) accompanied by further
  - 6 stirring;
  - 7 (D) aging the further stirred mixture of step (C) to form a product;
  - 8 (E) evaporating the product of step (D); and,
  - 9 (F) washing, filtering and drying the evaporated product of step (E).
- 1 2. The method of claim 1, wherein the first compound of step (A) is an alpha-tocopherol
- 2 polyethylene glycol ester.
- 1 3. The method of claim 2, wherein the alpha-tocopherol polyethylene glycol ester is d-
- 2 alpha-tocopheryl polyethylene glycol succinate (vitamin E TPGS).
- 1 4. The method of claim 1, wherein the first solvent of step (A) is selected from the group
- 2 consisting of *sec*-butanol, ethanol and water.
- 1 5. The method of claim 1, wherein the alumina source is Al tri-*sec*-butoxide.

- 1 6. The method of claim 1, wherein step (B) is carried out at 25-30°C for 3-4 hours.
- 1 7. The method of claim 1, wherein the aging in step (D) is carried out at 70 - 95 °C for  
2 2-7 days.
- 1 8. The method of claim 7, wherein the aging in step (D) is more preferably carried out  
2 at 90°C for 2 days.
- 1 9. The method of claim 1, wherein the product of step (D) is evaporated at 90°C for 10  
2 hours.
- 1 10. The method of claim 3 wherein, the amount of vitamin E TPGS ranges from 0.3 to  
2 0.9 g.
- 1 11. The method of claim 4 wherein, the amount of *sec*-butanol is 25 ml.
- 1 12. The method of claim 1, wherein said second solvent comprises water and *sec*-butanol.
- 1 13. The method of claim 12, wherein the amount of water is 1.08g and the amount of *sec*-  
2 butanol is 10 ml.

- 1 14. The method of claim 1, wherein the further stirred mixture of step C comprises  
2 alumina, vitamin E TPGS, water and *sec*-butanol.
- 1 15. The method of claim 14, wherein the molar ratio of alumina, vitamin E TPGS, water  
2 and *sec*-butanol is 100:1-3:300:270.
- 1 16. A mixture for the preparation of a mesoporous composition comprising vitamin E  
2 TPGS, *sec*-butanol, water and an alumina source.
- 1 17. The mixture of claim 16, wherein the alumina source is an alumino-silicate, a  
2 metallo-aluminate, an organo-aluminate or a mixture thereof.
- 1 18. The mixture of claim 16, wherein the alumina source is Aluminum-tri-*sec*-butoxide.
- 1 19. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:1-3:300:270 respectively.
- 1 20. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:1:200:35 respectively.
- 1 21. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:1:300:35 respectively.

1 22. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:2:300:35 respectively.

1 23. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:1:300:70 respectively.

1 24. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:2.5:300:35 respectively.

1 25. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:3:300:35 respectively.

1 26. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:1:200:35 respectively.

1 27. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:1:300:35 respectively.

1 28. The mixture of claim 18, comprising alumina, vitamin E TPGS, water and *sec*-  
2 butanol in the ratio 100:2:300:35 respectively.

- 1 29. A mixture for the preparation of a mesoporous composition comprising vitamin E  
2 TPGS, ethanol, water and an alumina source.
- 1 30. The mixture of claim 29 comprising, alumina, vitamin E TPGS, water and ethanol in  
2 the ratio 100:1:200:35 respectively.
- 1 31. The mixture of claim 29 comprising, alumina, vitamin E TPGS, water and ethanol in  
2 the ratio 100:1:300:35 respectively.
- 1 32. The mixture of claim 29 comprising, alumina, vitamin E TPGS, water and ethanol in  
2 the ratio 100:2:300:35 respectively.
- 1 33. The mixture of claim 29 comprising, alumina, vitamin E TPGS, water and ethanol in  
2 the ratio 100:1.5:300:35 respectively.
- 1 34. A mesoporous composition suitable for use in a drug delivery system prepared from a  
2 mixture comprising alumina, vitamin E TPGS, water and *sec*-butanol.
- 1 35. The mesoporous composition of claim 34, wherein the composition is insoluble in  
2 water relative to ethanol.
- 1 36. The mesoporous composition of claim 34, wherein the encapsulated vitamin TPGS is  
2 released when exposed to solutions having a pH of 1.2.

1 37. The mesoporous composition of claim 36 wherein the vitamin E TPGS is released  
2 as a micelle.

1 38. The mesoporous composition of claim 37 wherein the vitamin E TPGS micelle  
2 encapsulates lipophilic or pH sensitive drugs.

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